

ABSTRACT

Optical methods and devices for measuring temperature and a second physical parameter, using a single photoluminescent probe material comprised of a single luminophor, and methods and devices for determining temperature-corrected values of said second physical parameter, which can be an oxygen or air pressure or a parameter chosen from the group comprising an electrical current, a magnetic field and an electrical field or voltage. The luminophor is excited sequentially by a first excitation light of chosen first wavelengths and intensity P_1 , which generates a first luminescence light of intensity I_1 , and a second excitation light of chosen second wavelengths and intensity P_2 which generates a second luminescence light of intensity I_2 . The ratio $(I_2 \cdot P_1 / I_1 \cdot P_2)$ varies substantially in a known manner with varying temperature, substantially independent of the magnitude of said second physical parameter, thus providing a temperature correction factor to the measurement of said second physical parameter.